



**C23-EC-ECII-303**

**23131**

**BOARD DIPLOMA EXAMINATION, (C-23)  
OCTOBER/NOVEMBER—2024  
DECE – THIRD SEMESTER EXAMINATION  
DIGITAL ELECTRONICS**

*Time : 3 Hours ]*

*[ Total Marks : 80*

**PART—A**

**3×10=30**

- Instructions :** (1) Answer **all** questions.  
(2) Each question carries **three** marks.  
(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. (a) Convert  $(29)_{10}$  into binary  
(b) Convert  $(A86.B)_{16}$  into binary  
(c) Add  $(110110)_2$  and  $(111001)_2$
2. State De Morgan's theorems.
3. Define the terms Propagation delay, Fan-in and Fan-out of digital ICs.
4. List any three IC numbers of two input TTL Logic gates.
5. Draw the full adder circuit using two Half adders and an OR gate.
6. List any three applications of multiplexers.
7. State the need for preset and clear inputs.
8. Write any three differences between asynchronous and synchronous counters.

9. Classify different types of semiconductor memories.

10. Distinguish between EEPROM and UVEPROM.

**PART—B**

10×5=50

**Instructions :** (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. (a) Realize NOT, AND and OR operations using NAND gates only. 6

(b) Subtract  $(11001)_2$  from  $(11101)_2$  using 2's complement method. 4

12. (a) Simplify the Boolean expression  $Y = \bar{A}\bar{B}C + \bar{A}BC + A\bar{B}C + ABC$  using Karnaugh map. 5

(b) Explain the working of exclusive OR gate with truth table. 5

13. Explain the working of CMOS NAND gate with circuit diagram.

14. Draw and explain the working of 4-bit parallel adder circuit using full adders.

15. Draw the logic circuit and explain the working of 8×3 encoder.

16. Explain the operation of master-slave JK flip flop with circuit diagram.

17. (a) Explain the working of 4-bit shift right register with circuit diagram. 8

(b) Define the terms Modulus of a counter. 2

18. Explain the working of diode ROM with suitable circuit diagram.

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